

CLAIMS

1. Process for the decarbonatation of gas flows, preferably air, contaminated with CO₂, characterized in that the gas flow to be purified is placed in contact,
5 in an adsorption zone, with at least one adsorbent consisting essentially of a zeolite of NaLSX type with an Si/Al ratio of 1 to 1.15, exchanged with sodium to a degree of greater than or equal to 98%, the degree of exchange being expressed as the ratio between the
10 number of sodium ions and the number of aluminium atoms in a tetrahedral position, the remainder of the exchange capacity being occupied by potassium ions, agglomerated with a binder, the content of residual inert binder in the adsorbent being less than or equal
15 to 20% by weight.
2. Process according to Claim 1, in which the content of residual inert binder in the agglomerated zeolite composition is not more than 5% by weight.
3. Process according to Claim 1 or 2,
20 characterized in that it is performed by pressure swing adsorption (PSA) and preferably by pressure temperature swing adsorption (PTSA).
4. Process according to any one of Claims 1 to 4, in which the zeolite X has an Si/Al ratio of 1.
- 25 5. Process according to any one of Claims 1 to 4, in which the adsorption pressures are between 1 and 10 bar and the desorption pressures are between 0.1 and 2 bar.
6. Process according to any one of Claims 1 to 5,
30 characterized in that it comprises carrying out a treatment cycle comprising the steps:
 - a) passing the contaminated gas flow into an adsorption zone comprising the adsorbent bed, the adsorbent bed ensuring separation of the contaminant(s)
35 by adsorption,
 - b) desorbing the adsorbed CO₂ by establishing a pressure gradient and gradually lowering the pressure in the said adsorption zone in order to recover the CO₂ at the adsorption zone inlet;

c) raising the pressure of the said adsorption zone by introducing a stream of pure gas via the adsorption zone outlet.

7. Process according to Claim 6, in which the
5 adsorbent is regenerated at a temperature of between 100 and 120°C.

8. Process for purifying air contaminated with CO₂ and H₂O, characterized in that the gas flow to be purified is placed in contact, in an adsorption zone,
10 with at least one drying agent, preferably based on alumina, and at least with an adsorbent consisting essentially of a zeolite of NaLSX type with an Si/Al ratio of 1 to 1.15, exchanged with sodium to a degree of greater than or equal to 98%, the degree of exchange
15 being expressed as the ratio between the number of sodium ions and the number of aluminium atoms in a tetrahedral position, the remainder of the exchange capacity being occupied by potassium ions, agglomerated with a binder, the content of residual inert binder in
20 the adsorbent being less than or equal to 20% by weight.

9. Process according to Claim 8, characterized in that it comprises carrying out a treatment cycle comprising the steps:

25 a) passing the contaminated gas flow into an adsorption zone comprising a drying-agent bed and an adsorbent bed, as defined in Claim 1,

b) desorbing the adsorbed CO₂ by establishing a pressure gradient and gradually lowering the pressure
30 in the said adsorption zone in order to recover the CO₂ at the adsorption zone inlet;

c) raising the pressure of the said adsorption zone by introducing a stream of pure gas via the adsorption zone outlet.